ly marked than by use of (1) and (3) (Curves 1 and 2). A considerable extension of the induction period is observed in the transition from (3) to (4) (Curve 4). The vulcanization activity is also reduced by replacing the cyclohexyl radical by a phenyl radical. Thus, it was proved that - by introducing radicals of different structure into the amino group of benzothiazol-sulphene amides - accelerators can be produced which considerably differ from each other with respect to their vulcanization activity. This applies particularly to the duration of the induction period of vulcanization. A thesis established by the authors is of interest, according to which a rapid acceleration of vulcanization in the initial stage is observed on transition from the sulphene-amide compounds with a characteristic group $-S-\overset{|}{N}-$ to compounds containing the groups $-S-\overset{|}{\underset{|}{C}}-N-$ (Fig 2). The data on the change in maximum swelling, also mentioned here, show that the structuration effect appears at an earlier vulcanization stage in the presence

of 2-mercaptobenzothiazol derivatives as compared with sulphene-amide compounds. This regulation possibility of the vulcanization dynamics by suitable accelerators is of high technical importance. The use of accelerator (2) preferably used as against (1) for rubber mixtures with highly disperse furnace soot is finally discussed. The resulting vulcanization kinetics also favors the higher binding strength of multilayered rubber products (Ref 4), and increases the resistance of the vulcanizates to repeated deformation (Ref 1). There are 3 figures, 1 table, and 4 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

PRESENTED: May 26, 1959, by A. A. Balandin, Academician

SUBMITTED: May 26, 1959

S/138/60/000/005/007/012
A051/A029

AUTHORS: Betts, G.E., Karmin, B.K., Eytingon, I.I., Zhakova, V.G., Strel'nikova, N.P.

TITLE: The Mastication of Natural Rubber with O-Benzamidothiophenol, its Zinc Salt and O,O' -Dibenzamidodiphenyldisulfide

PERIODICAL: Kauchuk i Rezina, 1960, No. 5, pp. 24 - 27

TEXT: After brief reference to a previous article published in "Kauchuk i Rezina", 1959, No. 8, p. 32 by the authors on the action of thiophenols and their derivatives on the mastication of natural rubber, they point out that the present article deals with the results of an investigation of o-benzamidothiophenol, its zinc salt and o,o' -dibenzamidothiophenyldisulfide (peptan 22). The method by which o-benzamidothiophenol was obtained is described. It is stated that the mechanism of the reaction has not yet been clarified. The structural formulae of the reduction reaction are given for o,o' - dibenzamidodiphenyldisulfide, reduced to o-benzamidothiophenol with sodium hydroxide and glucose. The physical and chemical properties of the obtained product are given: melting point 101 -

Card 1/3

S/138/60/000/005/007/012
A051/A029

The Mastication of Natural Rubber with O-Benzamidothiophenol,its Zinc Salt and O,O' -Dibenzamidodiphenyldisulfide

- 103°C, yield 75%. O-benzamidothiophenol has a characteristic odor, is hardly soluble in water and dissolves well in hot alcohol, and in acetone and chloroform when cold. The authors outline the procedure for obtaining the zinc salt of the original product, and describe its chemical and physical properties. It is pointed out that the salt obtained by the given method has similar properties as the imported salt. The activity of the benzamidothiophenol and its derivatives in mastication of rubber was further studied under laboratory conditions. The details of the investigation are submitted whereby laboratory rollers and the Krupp-Gruzon rubber mixer were used. Various concentration of pepton 22 were applied and the kinetics of the mastication at these concentrations can be seen in Figure 1. The obtained data reveal that the most active of the three investigated accelerators of mastication at the temperatures investigated, was o-benzamidothiophenol. Pepton 22 seemed to be the least active in the region where the mastication effectiveness dropped with an increase in the temperature. The zinc salt of o-benzamidothiophenol held an intermediate position. In

Card 2/3

S/138/60/000/005/007/012
A051/A029

The Mastication of Natural Rubber with O-Benzamidothiophenol, its Zinc Salt and O,O' - Dibenzamidodiphenyldisulfide.

the temperature region where the mastication rate increases with an increase in the temperature, the activities of the disulfide and the zinc salt of o-benzamidothiophenol gradually approach each other. The technological and technical properties of the masticated rubber obtained by o-benzamidothiophenol and its derivatives are discussed. Pepton 22 is recommended for industrial use as an accelerator of mastication, in addition to the zinc salt of o-benzamidothiophenol. Both are only slightly toxic and stable. The zinc salt is recommended for use at temperatures below 130°C, and peptone 22 at temperatures above 130°C. There are 5 figures and 1 table.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry).

Card 3/3

FEL'DSHTEYN, M.S.; EYTINGON, I.I.; DOGADKIN, B.A.

Vulcanizing action of bis(oxydiethylenethiuram) disulfide.
Vysokom.soed. 2 no.1:97-102 Ja '60. (MIRA 13:5)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Vulcanization) (Disulfide)

87917

15.9120 only 2209
11, 2211

S/138/60/000/008/002/015
A051/A029

AUTHORS: Shvartz, A.G.; Kamenskiy, B.Z.; Eytingon, I.I.

TITLE: The Vulcanization of Rubbers Using Synthetic Resins

PERIODICAL: Kauchuk i Rezina, 1960, No. 8, pp. 5 - 9

TEXT: Based on previously successful attempts at vulcanizing natural rubber with synthetic resins, such as those described in Refs. 1 - 13, the authors investigated the possibilities of using Soviet-produced resins for vulcanizing butyl rubber, natural rubber, СКС-30АМ (SKS-30AM) and СКН-26 (SKN-26), where the industrial resin 101 was chosen as the vulcanizing agent. The latter is the product of the alkaline condensation of n-tertiary butylphenol and formaldehyde. Amberol СТ -137 (ST-137), the condensation product of n-octylphenol and formaldehyde was taken as the second vulcanizing agent for comparative purposes. The practical application of the alkylphenolformaldehyde resins as vulcanizing agents of butadiene-nitrile rubber was introduced only recently and is described in the works of A.S. Novikov, I.A. Skub and K.F. Kaluzhenina (Works of the NIIRP, No. 3, Goskhimizdat 1956,). The improvement in the qualities of the vulcanizates obtained by using the resins in vulcanizing butyl rubbers is explained by the formation of transverse

Card 1/3

The Vulcanization of Rubbers Using Synthetic Resins

bonds of the -C-C- and -C-O-C- type, which are more resistant to thermomechanical action than the -C-S-C- and -C-S-C- bonds (Ref. 6). Data already available showed that rubber vulcanized with alkylphenolformaldehyde resins as a result of their high thermal stability of the transverse bonds formed do not exhibit a tendency to vulcanization reversion and changes in the values of the residual expansion in aging, neither in prolonged vulcanization periods nor at temperature increases. These latter qualities render the rubber applicable to manufacturing goods which maintain constant dimensions at high temperatures. The results of the authors' experiments using these resins showed that the alkylphenolformaldehyde resins of alkaline condensation could be used for vulcanizing various rubbers. The rubbers obtained by this vulcanization were found to be more resistant to thermomechanical action than those vulcanized with sulfur in the usual way. In using the resin 101 as the vulcanizing agent, chlorine compounds were applied as activators. Rubbers based on natural rubber oil butadiene-styrene (SKS-30AM) and butadiene-nitrile (SKN-26) rubbers, vulcanized with alkylphenolformaldehyde resins, were also found to have a higher aging resistance than those vulcanized with sulfur. Their dynamic properties do not drop and the stability of adhesion at the interface of doubled rubber increases. Finally, the latter rubber has more resistance to creeping than those vulcanized with sulfur. It was also concluded that the properties of

87917

S/138/60/000/008/002/015
A051/A029

The Vulcanization of Rubbers Using Synthetic Resins

the rubbers with resins based on n-tertiary butylphenol (resin 101) are somewhat inferior to those based on n-octylphenol (resin Amberol St-137) in their properties. The results showed that the study of vulcanization using alkylphenolformaldehyde resins is very promissing for the production of thermo-resistant rubbers. There are 7 tables, 4 graphs, 13 references: 2 Soviet, 8 English, 2 French, 1 German.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

Card 3/3

S/138/60/000/011/005/010
A051/A029

AUTHORS: Eytingon, I.I., Karmin, B.K., Zhakova, V.G., Betts, G.E., Kamenskaya, S.A.

TITLE: Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

PERIODICAL: Kauchuk i rezina, 1960, No. 11, pp. 21-24

TEXT: The results are given of work carried out on the synthesis and study of paratertiary butylphenolmercaptane, dimethylphenylparacresolmercaptane, their zinc salts and disulfides, as accelerators of natural rubber mastication. The method for producing the listed accelerators is outlined and a characteristic evaluation of these is given. Corresponding disulfides were used as the initial products for producing substituted arylmercaptanes. Both products under investigation were obtained by reacting sulfur monochloride with paratertiary butylphenol and dimethylphenylparacresol. The reaction is given as:

Card 1/10

S/138/60/000/011/005/010
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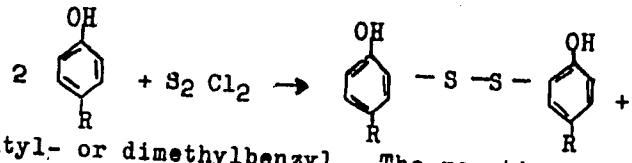
Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides



+ 2HCl; where R is the tertiary butyl- or dimethylbenzyl. The reaction was carried out in a solution of dichloroethane at its boiling point. Sulfur monochloride was added gradually, mixing for 2 hours. At the end of the reaction the dichloroethane was distilled off and the product obtained dried in a vacuum at a temperature of 40-50°C until a constant weight was achieved. The disulfide yields were 82 and 87% of the theoretical, respectively. The obtained products, which were resin-like substances, were subjected to an elementary analysis. The results were: for

Card 2/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

	C	H	S
$C_{20}H_{26}O_2S_2$			
calculated	66.26	7.23	17.68
found	66.67	7.36	17.02
$C_{30}H_{30}O_2S_2$			
calculated	74.07	6.17	13.16
found	74.40	5.99	12.81

The results showed that the synthesized substances correspond to disulfide of paratertiary butylphenol and disulfide dimethylphenylparacresol. In order to obtain corresponding mercaptanes from the disulfides the reduction method was used with glucose and alkali hydroxide in an alcohol-aqueous medium (Ref. 3). Results of an analysis of the zinc content in the zinc salt of the corresponding mercaptane proved that sodium mercaptide and not phenolate is formed when reducing the disulfides with glucose and a calculated quantity of alkali hydroxide. The mercaptane yield was 90 and

Card 3/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

97% of the theoretical, respectively. Zinc salts of the paratertiary butylphenolmercaptane and dimethylphenylparacresolmercaptane were obtained from the respective sodium mercaptides formed in the process of the disulfide reduction. The yield of the commercial product was 96% of the theoretical. The zinc content for the $C_{20}H_{26}O_2S_2Zn$ was calculated to be 15.2% and found experimentally as 14.7%. The authors point out that they were first to obtain the mercaptanes of the paratertiary butylphenol and dimethylphenylparacresol, their zinc salts and also dimethylphenylparacresol disulfide. A study was carried out of the action of the paratertiary butylphenolmercaptane, dimethylphenylparacresolmercaptane and their derivatives on the mastication of natural rubber. Fig. 1 shows the effect of various doses of mastication accelerators on natural rubber processing on rollers, and Fig. 2 the kinetics of mastication at 100°C. Data on the effect of temperature on the mastication on rollers are given in Fig. 3. The tested substances form the following decreasing series according to

Card 4/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

their effectiveness on the mastication process: paratertiary butylphenolmercaptane, dimethylphenylparacresolmercaptane > zinc salts > disulfides. The greater activity of the mercaptane as compared to the zinc salts, etc., corresponds with data obtained previously by the authors in studying trichlorothiophenol, pentachlorothiophenol, orthobenzamide thiophenol and their derivatives (Ref. 1,2). It was further found that the mastication of natural rubber in the presence of paratertiary butylphenolmercaptane, dimethylphenylparacresolmercaptane, their zinc salts and disulfides is hardly effective on the tendency of the breaker mixtures to scorching, or on the vulcanization rate and physico-mechanical properties of their vulcanizates. The authors state in conclusion that for industrial application only the zinc salts of mercaptanes are of interest, since mercaptanes are toxic and easily decompose when stored, and the disulfides have a resinlike consistency. There are 3 sets of graphs, 1 table and 3 references: 2 Soviet and 1 German.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

Card 5/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

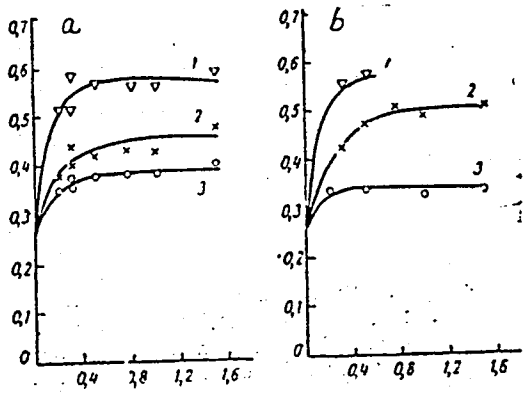


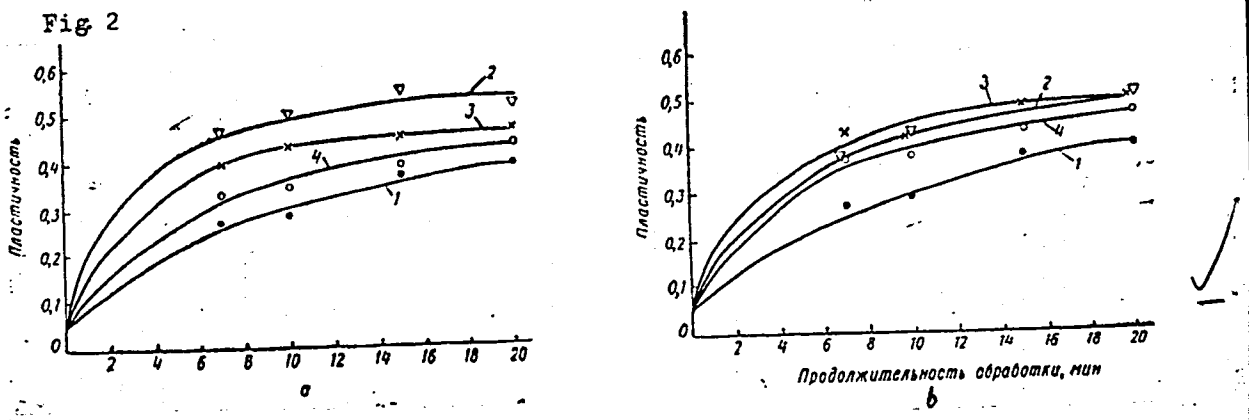
Fig. 1
Vertical legend: Plasticity
Horizontal legend: Dosage of the accelerator, weight parts to 100 weight parts of rubber
Effect of various dosages of mastication accelerators on NR processing on rollers at a temp. of 100°C for a period of 10 min. a-mastication accelerators of the group of paratertiary butylphenolmercaptane 1-paratertiary butylphenolmercaptane, 2-zinc salt, 3-disulfide; b-mastication accelerators of the group of dimethylphenylparacresolmercaptane, 1-dimethylphenylparacresolmercaptane, 2-zinc salt, 3-disulfide.

Card 6/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

Fig. 2



Card 7/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

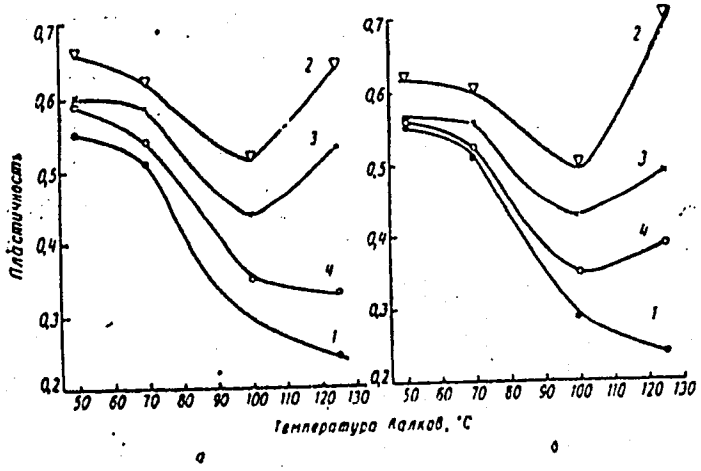
Fig 2 (continued)
Vertical legend: Plasticity
Horizontal legend: Processing duration, min.
Kinetics of NR mastication on rollers at a temperature of 100°C in the presence of mastication accelerators (dosage-0.3 w.p. to 100 w.p. of rubber):
a-mastication accelerators of the group of paratertiary butylphenolmercaptane; 1-without accelerator, 2-paratertiary butylphenolmercaptane, 3- zinc salt, 4-disulfide
b-mastication accelerators of the group of dimethylphenylparacresolmercaptane; 1-without accelerator, 2-dimethylphenylparacresolmercaptane, 3-zinc salt, 4-disulfide

Card 8/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

Fig. 3



Card 9/10

S/138/60/000/011/005/010
A051/A029

Mastication of Natural Rubber in the Presence of Para-Tertiary Butylphenolmercaptane, Dimethylphenylparacresolmercaptane, Their Zinc Salts and Disulfides

Fig. 3 (continued)
Vertical legend: Plasticity
Horizontal legend: Temperature of the rollers, °C
Effect of processing temperature on the NR mastication on rollers for a period of 10 min in the presence of accelerators of mastication (dosage 0.3 w.p. to 100 w.p. of rubber):
a-mastication accelerators of the group of paratertiary butylphenolmercaptane: 1-without accelerator, 2-paratertiary butylphenolmercaptane, 3-zinc salt, 4-disulfide
b-mastication accelerators of the group of dimethylphenylparacresolmercaptane: 1-without accelerator, 2-dimethylphenylparacresolmercaptane, 3-zinc salt, 4-disulfide.

Card 10/10

EYTINGON, I.I.

S/081/61/000/023/052/061
B106/B101

AUTHORS: Betts, G. E., Zhukova, V. G., Karmin, B. K., Strel'nikova, N. P., Eytingon, I. I.

TITLE: Chemical mastication accelerators for natural and synthetic rubber and prospects of their application

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 23, 1961, 559, abstract 23P344. (Tr. N.-i. in-ta shin. prom-sti, sb. 5, 1960, 21-35)

TEXT: Numerous compounds have been examined, many of which are vulcanization accelerators. Dimethyl phenyl p-cresol (I) was found to be the most active chemical mastication accelerator for СКС-30 (SKS-30) rubber. In the presence of 1.2 parts by weight of I, mastication can be carried out in kettles within 30 to 50 min at 130°C as against 70 min at 155°C without I. A similar accelerating action is exerted by I on the mastication of СКН (SKN) and СКИ(SKI) rubber, but not on that of НК (NK) rubber. Active mastication accelerators for NK rubber are Renacit II, IV, and V (trichlorothiophenol, zinc salt of pentachlorothiophenol, or pentachlorothiophenol, respectively), Vulkamel TBN (30% thio-β-naphthol and 67% inert paraffin),

Card 1/2

[redacted]

[redacted] different ways, depending on the type of rubber, filler, and other ingredients. Of great importance are the cooling conditions of the masticated rubber. Scorching is frequently increased by water cooling. Accelerators permit mastication in closed rubber mixers and preparation of compounds at the same time. Accelerators that are active at relatively low temperatures, such as Renacit IV and Pentone 65, are required for this purpose. [Abstracter's note: Complete translation.]

Card 2/2

S/079/60/030/009/014/015
B001/B064

AUTHORS: Eytingon, I. I., Strel'nikova, N. P.

TITLE: Synthesis of Some 4-Morpholine- and 1-Piperidine Carbothiosulfene Dialkylamides

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 9, pp. 3137-3139

TEXT: The authors had previously synthesized and described (Ref. 1) some 1,4-piperazine bis-carbothiosulfene dialkylamides. The compounds obtained were tested for their accelerating effect in the sulfur vulcanization of natural and synthetic rubbers. In the present case, hydrogen sulfide was reacted with morpholine or piperidine in an alkaline medium. The sodium salts of the resulting dithiocarbamic acids were condensed with secondary aliphatic amines in an acid medium. The following four hitherto unknown products resulted: 4-morpholine carbothiosulfene dimethylamide (I), 4-morpholine carbothiosulfene diethylamide (II), 1-piperidine carbothiosulfene dimethylamide (III), and 1-piperidine carbothiosulfene diethylamide (IV). Schemes:

Synthesis of Some 4-Morpholine- and 1-Piperidine Carbothiosulfene Dialkylamides

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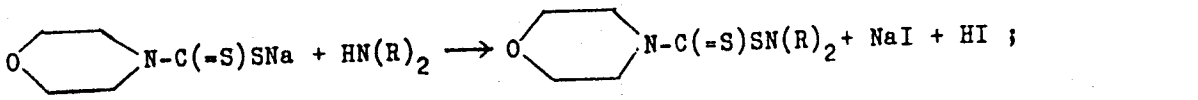
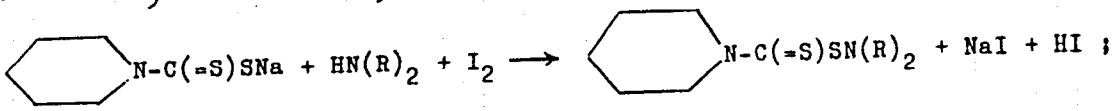
B001/B064



(I) R = CH_3, (II) R = C_2H_5 and



(III) R = CH_3, (IV) R = C_2H_5. The syntheses are described in detail in the experimental part. There is 1 Soviet reference.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: September 25, 1959

Card 2/2

S/079/60/030/012/026/027
B001/B064

AUTHOR: Eytingon, I. I.

TITLE: Synthesis of Some Asymmetrical Thiuram Sulfides Containing Aliphatic and Heterocyclic Groups in the Molecule

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 12, pp. 4104 - 4107

TEXT: When studying effective accelerators for the sulfur vulcanization of natural and synthetic rubber, the author synthesized asymmetrical thiuram sulfides containing several aliphatic and heterocyclic groups in the molecule; in publications, only one reference is made (Ref.3) to dimethyl thiocarbamyl-1-piperidino thiocarbonyl sulfide and dimethyl thiocarbamyl-4-morpholinothiocarbonyl sulfide without giving details. The following products, hitherto unknown, were synthesized: diethyl thiocarbamyl-1-piperidinothiocarbonyl sulfide (I), diethyl thiocarbamyl-4-morpholinothiocarbonyl sulfide (II), bis-dimethyl thiocarbamyl-1,4-piperazino-bis-thiocarbonyl-sulfide (III), and bis-diethyl thiocarbamyl-1,4-piperazino-bis-thiocarbonyl sulfide (IV). They were obtained by

Synthesis of Some Asymmetrical Thiuram Sulfides Containing Aliphatic and Heterocyclic Groups in the Molecule

S/079/60/030/012/026/027
B001/B064

reacting dimethyl- or diethyl thiocarbamyl chloride with the sodium salts of piperidine carbodithio-1-acid, morpholinocarbodithio-4-acid and piperazino-biscarbodithio-1,4-acid in aqueous medium. Dimethyl- or diethylthiocarbamyl chloride were, accordingly, synthesized from tetramethyl- or tetraethyl thiuram disulfide by treatment with chlorine at low temperature in carbon tetrachloride medium. There are 3 non-Soviet references: 2 German.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: January 3, 1960

Card 2/2

28800

S/138/61/000/009/004/011
A051/A129

15.9130

AUTHORS: Tarasova, Z. N., Eytingon, I. I., Senatorskaya, L. G., Fedorova, T. V., Dogadkin, B. A.

TITLE: Application of phenothiazine (thiodiphenylamine) as an antifatigue agent of NR, СКИ (SKI) and СКС-30АМ (SKS-30AM) vulcanizates

PERIODICAL: Kauchuk i rezina, no. 9, 1961, 15 - 18

TEXT: A study was carried out to determine the action of phenothiazine during the vulcanization and fatigue of NR, SKI and SKS-30AM rubbers. It was established that phenothiazine has no significant effect on the kinetics of vulcanization and on the standard physico-mechanical properties of the vulcanizates. It increases the durability of the vulcanizates from the given rubbers during the process of repeated deformations under various conditions of fatigue. Phenothiazine or the products of its transformation combine with the vulcanizate under the effect of thermo-oxidizing action and repeated deformations. No combining of phenothiazine was noted during the process of thermal action alone. Phenothiazine in conjunction with certain oxidation inhibitors has more than just an additive action (mutually-intensifying action). A study of the exchange ability of the

Card 1/4

Application of phenothiazine...

vulcanizates with elemental sulfur showed that phenothiazine does not affect the nature of the vulcanizing structures, and during vulcanization at 143°C causes noticeable changes in the type of the sulfur bonds at temperatures of 173°C. A further study of its ability to react in isotope exchange with elemental sulfur showed that under vulcanization at 173°C there is no noticeable sulfur exchange in phenothiazine. Data of Table 1 reveal that phenothiazine reduces the rate of chemical relaxation by 3 to 7 times in NR vulcanizates and by a factor of two in vulcanizates of SKI, and by 2 - 3 times in SKS-30A vulcanizates. It has a more effective action in rubbers produced at elevated vulcanizing temperatures than other known anti-fatigue agents, such as N-phenyl-N'-cyclohexyl-n-phenylenediamine (4010). Phenothiazine increases the durability of the vulcanizates during the process of repeated deformations in symmetrical sign-changing loading and in repeated bending. It reacts with the products of oxidation, stabilizing the latter and thus preventing the further development of the thermo-oxidizing destruction. The application of a system of inhibitors having a combined intensifying action shows promise in extending the service life of rubbers and stabilizing them. There are 2 tables, 1 set of graphs and 9 references: 6 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows:

Application of phenothiazine...

Murphy, Ravner, Smith, Ind. Eng. Chem., 42, no. 2, 2479 (1950); A. Tobolsky, J. Appl. Phys., 27, no. 7, 673 (1956).

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

Table 1. Effect of the type of the anti-fatigue agent introduced into the mixture on the rate of chemical relaxation of tension and the durability of the vulcanizates during the fatigue process (dosage of anti-fatigue agent 1.0 w.p. to 100 w.p. of rubber)

Type of rubber	Type of anti-fatigue agent	Vulcanization conditions		Rate of relaxation constant at 130°C, $\min^{-1} \cdot 10^{-3}$		Durability in deformations, 1,000 cycl.	
		temp., °C	duration, min	in air	in non-oxygen conditions	symmetr. sign-exch. loading at 100°C	repeated bending pinning at 20°C
NR	without anti-fatigue agent	143	20	38.0	1.11	1,934	-
	phenothiazine	143	20	11.5	1.97	3,217	-

Card 3/4

Application of phenothiazine...

Table 1. (continued)

	N-phenyl-N'-cyclo-hexyl-n-phenylene-diamine (4010) . . .	143	20	7.4	-	5,489	-
	without anti-fatigue agent	173	5	-	-	-	292
	phenothiazine . . .	173	5	6.1	-	-	600
	N-phenyl-N'-cyclo-hexyl-n-phenylene-diamine (4010) . . .	173	5	12.7	-	-	405
SKS-30	without anti-fatigue agent	143	20	42.3	-	6,746	-
	phenothiazine	143	20	13.8	-	8,390	-
	N-phenyl-N'-cyclo-hexyl-n-phenylene-diamine (4010) . . .	143	20	19.9	-	-	-
SKI-3	without anti-fatigue agent (rubber stabilized with 0.5% neozone D and 0.5% 1,4-diphenyl-n-phenylenediamine)	138	40	20.5	-	-	85
	phenothiazine . . .	138	40	11.2	-	-	145

Card 4/4

15.9130

28949
S/138/61/000/010/004/009
A051/A129

AUTHORS: Fel'dshteyn, M.S., Chernomorskaya, I.G., Eytingon, I.I., Gur'yanova, Ye.N., Dogadkin, B.A.

TITLE: Vulcanizing acitivity of certain derivatives of 2-mercaptobenzothiazole and their ability to exchange with radioactive di-2-benzothiazyldisulfide

PERIODICAL: Kauchuk i rezina, no. 10, 1961, 15 - 18

TEXT: The characteristic features are given of the vulcanization activity of certain N-benzothiazole-2-thion and 2-thiobenzothiazole derivatives, according to the kinetics of sulfur addition and the change in maximum swelling. The data which characterize this activity indicate that the S substituted derivatives do not affect the rate of vulcanization (the graph), nor the effectiveness of the structuralizing process. The weak effect of vulcanization which is noted is thought to be connected with the presence of sulfur in the rubber mixture. N-benzothiazole-2-thion derivatives are effective accelerators of vulcanization. The results of the investigation into the reaction between N-benzothiazole-2--thion and 2-thiobenzothiazole derivatives on the one hand, and labelled S^{35} in

Card 1/5

28949
S/138/61/000/010/004/009
A051/A129

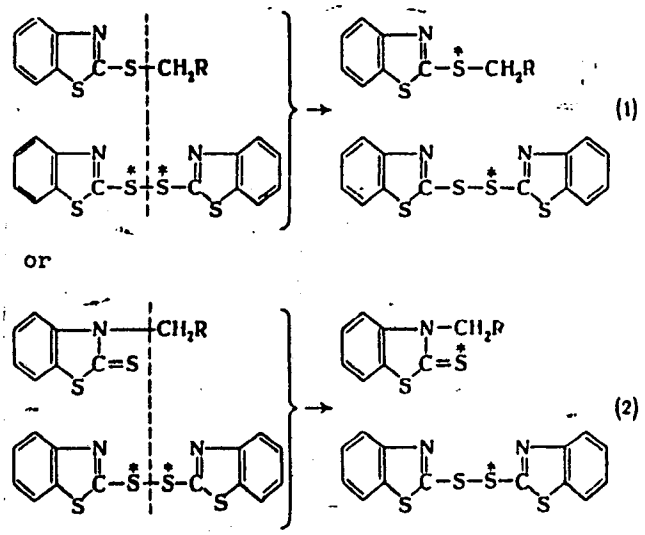
Vulcanizing activity ...

di-2-benzothiazyldisulfide on the other hand are presented. The method of labelled atoms (S^{35}) is used to investigate the mobility of the thiobenzothiazolyl radicals in certain N-benzothiazole-2-thion derivatives and 2-thiobenzothiazole derivatives. The reaction scheme of exchange is given as follows:

Card 2/ 6

28949
S/138/61/000/010/004/009
A051/A129

Vulcanizing activity ...



(1)

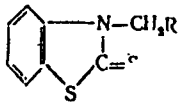
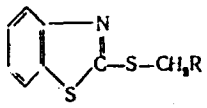
or

(2)

Card 3/ 6

28949 S/138/61/000/010/004/009
A051/A129

Vulcanizing activity ...

Experimental data showed that there is a direct link between the vulcanizing activity of the investigated compounds and their ability to exchange with the thiobenzothiazolyl radicals. The same elementary act - the formation of the thiobenzothiazolyl radicals - is the basis of both processes. The data of the vulcanizing activity and exchange ability are compared with the results of the structural investigation. It was established that the sharp differences in the vulcanizing activity of the investigated compounds are explained by a difference in their structure. The bond strength of $N-CH_2R$ in the compounds of the type  is less than the bond strength of $S-CH_2R$ in compounds: 

It is pointed out that amongst derivatives of 2-mercaptobenzothiazole compounds characterized by the presence of the C-S-C grouping do not have an accelerating effect on the vulcanization process, whereas the corresponding sulfenamide C-S-N and disulfide C-S-S compounds are highly-active accelerators of vulcani:- -

Card 4/5

28949
S/138/61/000/010/004/009
A051/A129

Vulcanizing activity ...

zation. These reactions of exchange by the thiobenzothiazolyl radicals may thus be used in the synthesis of the corresponding accelerators of vulcanization labelled with radioactive sulfur. There are 3 tables, 1 graph and 5 Soviet-bloc references.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

Card 5/6

DROZDOVSKIY, V.F.; SOKOLOV, S.A.; SHOKHIN, I.A.; EYTINGON, I.I.

Activators of rubber reclaiming process. Kauch. i rez. 20 no.12:22-25 D '61. (MIRA 15:1)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Rubber, Reclaimed)

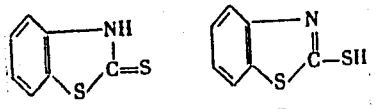
S/079/61/031/011/012/015
D202/D305

AUTHORS: Gur'yanova, Ye. N., Eytingon, I. I., Fel'dshteyn, M. S., Chernomorskaya, I. G., and Dogadkin, B. A.

TITLE: Investigation of the structure of some 2-mercapto benzthiazole derivatives by the method of dipole moments

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 2, 1961, 3709-3712

TEXT: The subject of this experimental work was to establish the cause of differences in the behavior of mercapto benzthrazole (MBT) derivatives as vulcanization accelerators. It is known that the thiazol group of MBT may have a twofold structure:



(A) Form (A) (B) Form (B)

Card 1/4

Investigation of...

Therefore, derivative groups may be linked either with N or with S. In the authors' opinion, the best method of ascertaining to which tantomeric form a particular derivative belongs is to determine its dipole moment--as the dipole moment of the form (A) ≈ 4.5 D, and that of form (B) ≈ 2.2 D . The authors synthesized 12 MBT derivatives by adding the following groups: I - $\underset{\underset{H}{|}}{N}-C_6H_{11}$, II - $N(C_6H_{11})_2$, III - $\underset{\underset{H}{|}}{N}-C_6H_5$

IV - $\underset{\underset{CH_3}{|}}{N}-C_6H_5$, V -  , VI - CH_3 , VII - $CH_2-N-(CH_3)_2$,

VIII - $CH_2N(CH_2H_5)_2$, IX - CH_2 -  , X - CH_2OH ,

XI - CH_2-CH_2OH , XII - CH_2COOH ; and determined their dipole moments. They found that in compounds I - V, the dipole moments were in the range 1.73 - 3.01 D, these fluctuations being due to different dipole moments of the added amino groups. The compound VI has a small moment equal to

Card 2/4

Investigation of....

1.33 D; therefore, all these groups are linked with S, and the derivatives have the (B) structure. In compounds VII – X, the dipole moments were in the range 4.38 – 4.72 D; therefore, the addition groups are linked to N, and the compounds have the (A) structure. The authors do not discuss the accelerating properties of all derivatives and only point to the fact that X—a hydromethyl—and XI—a hydroethyl derivative—having quite different properties as accelerators have different dipole moments as well. X has 4.58 D and XI—2.33 D, the first being a N-linked derivative and second a S-linked one. Compound XII has a dipole moment of 4.44 D, but is of the (B) structure, its high moment being due to the carbonyl group. There are 1 table and 11 references: 7 Soviet-bloc and 4 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: H. Koch, J. Chem. Soc. 401 (1949); T. Levi, U. S. Pat. 2,019,059, (1935); W. Sexton, A. Spinks, J. Chem. Soc. 1717, (1948); P. Oesper, G. Lewis, C. Smyth, J. Amer. Chem. Soc. 64, 1130, (1942).

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i fiziko-khimicheskiy institut im. L. Ya. Karpova (Scientific

Card 3/4

S/079/61/031/011/012/015
D202/D305

Investigation of...

Research Institute of the Tire Industry and Physico-Chemical Institute im. L. Ya. Karpov

SUBMITTED December 2, 1960

Card 1/4

GUR'YANOVA, Ye.N.; EYTINGON, I.I.; FEL'DSHTEYN, M.S.; CHERNOMORSKAYA, I.G.; DOGADKIN, B.A.

Structure of some derivatives of 2-mercaptobenzothiazole studied by the dipole moment method. Zhur. ob. khim. 31 no. 11:3709-3712 N '61. (MIRA 14:11)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i Fiziko-khimicheskiy institut imeni L.Ya. Karpova.
(Benzothiazole—Dipole moments)

15 9130 2209, 1526, 1451

22437
S/080/61/034/007/012/016
D223/D305

AUTHORS: Eytingon, I.I., Fel'dshteyn, M.S., and Pevzner, D.M.

TITLE: The vulcanizing action of some heterocyclic n-thiocarbonylsulpho-dialkylamides

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 7, 1961, 1591 - 1597

TEXT: Dithiocarbominic acid possesses a high vulcanizing activity and as a rule causes premature vulcanization of resin mixture. It is already known that 2-mercaptobenzothiazol possesses vulcanizing activity which at initial stages of the process is appreciably governed by the nature and number of heteroatoms in the molecule. In this connection, it was interesting to ascertain the effect of heterocyclic groups in N-thiocarbonylsulphodialkylamides on the vulcanizing activity of the latter. With this aim in mind a series of heterocyclic N-thiocarbonylsulphodialkylamides were synthetized containing piperidine, morpholine and piperazine groups. The syn-

Card 1/3

The vulcanizing action of ...

thesis of these compounds is characterized by sulphoamide groups $(R' R'')N - \underset{\underset{S}{\|}}{C} - S - N(R''' R'''')$ (where (R' R") N-heterocyclic or di-alkylamine radicals and R"' and R"" - alkyl radical) and it was obtained by the interaction of corresponding piperidine, morpholine and piperazine with sulphocarbons in an alkaline medium with subsequent oxidation condensation of the products of reaction with secondary aliphatic amines. The vulcanizing activity of these compounds was investigated on the mixtures of natural and butadienstyrol (SKS-30 AM) rubbers at a vulcanization temperature of 143°C. To compare the effect of heterocyclic group on the vulcanizing activity of N-thiocarbonylsulphodialkylamides, N,N-diethylthiocarbonylsulphodialkyl amides were chosen. For the natural rubber a typical, unadultered blend was used containing besides zinc oxide and stearic acid, 3 wt. parts of sulphur. The accelerator used was N, N-diethyl-2-benzotiazolesulphonamide 1.2 wt. parts per 100 wt. parts of rubber. The results on vulcanizing activities are given in graphic form. The results indicate that the vulcanization

Card 2/3

The vulcanizing action of ...

activity of N-thiocarbonylsulphoalkyalamides on the basis piperidine, morpholine and piperazine is high, that compounds of this type are highly active accelerators of vulcanization of the blends of natural and butadiene styrol rubbers, yielding better structural and specification properties when compared to the usual accelerators of vulcanization in the production of high-moduli resin. They also show that the kinetics of vulcanization is basically connected with the nature and number of heteroatoms in the molecule of accelerator. It may be seen that morpholine and piperazine, when compared with piperidine, show a greater retarding action at initial stages of the vulcanization process and impart greater stability of the resin blends to premature vulcanization. There are 7 figures, 1 table and 7 Soviet-bloc references.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti Moskva (Scientific Research Institute of the Tire Industry, Moskow)

SUBMITTED: October 29, 1960

Card 3/3

27347
S/080/61/034/009/013/016
D204/D305

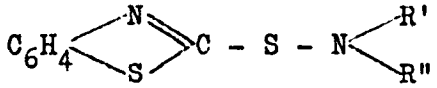
15.9130

AUTHORS: Fel'dshteyn, M.S., Chernamorskaya, I.G., Gur'yanova, Ye.N., and Eytingon, I.I.

TITLE: The vulcanizing activity of sulfenamide derivatives of 2-mercaptobenzothiazole and exchange of thiobenzothiazolyle radicals with radioactive di-2-benzothizyldisulphide

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 9, 1961, 2073 - 2079

TEXT: The authors wanted to study different sulfenamide derivatives of 2-mercaptobenzothiazole. These are used widely in industry as vulcanization accelerators. They have the general formula



and the vulcanizing effect depends to a large extent on the struc-

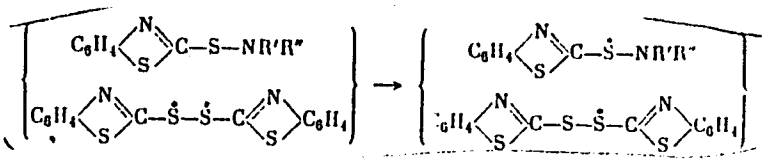
The vulcanizing activity of ...

ture of the R' and R" radicals. The derivatives were introduced into a mixture of butadienesterol rubber (CKC-30APM) and a small amount of sulphur (1.5 parts by weight to a 100 parts by weight of rubber) and vulcanized at a 143°. N,N-diethyl-,N-cyclohexyl- and N-oxydiethylene-2-benzothiazolsulfenamide form vulcanizing structures after 30 minutes heating whilst these structures are formed at a later stage of the process in the presence of N,N-dicyclohexyl and N-methyl-N-phenyl-2- benzothiazosulphenamides. This is technologically important because of the rapid viscosity rise. Moreover, the kinetics of the process can be, to a large extent, controlled. As regards the structural factors responsible for differences in vulcanizing activity of the sulphenamides the strength of chemical bond and the ease with which the molecule can form separate radicals is of prime importance. The mechanics of radical exchange has been studied using labelled atoms by Ye.N. Gur'yanova (Ref. 3: sb. dokl. "Vulkanizatsiya rezin". Goskhimizdat, 101, 1954) In the present work the exchange of thiobenzothiazolyle groups was studied between the investigated compounds on the one hand and

27347
S/080/61/034/009/013/016
D204/D305

The vulcanizing activity of ...

di-2-benzothiazyldisulphyde with a labelled S^{35} atom in the disulphide bridge on the other:



The isotope exchange reaction was effected in toluene at a di-2-benzothiazyldisulphide/sulphenamide ratio of 1:2, avoiding side reactions and separating the rubber mixture components by paper chromatography. As regards exchange capacity the compounds can be classified as follows: N-cyclohexyl- $\geq$ N-oxydiethylene (N-methyl-N-penyl-)- $>$ N,N-dicyclohexyl- $\geq$ N-phenyl-2-benzothiazolsulfenamide. This too is of the order of vulcanizing activity. Thus, using sulfenamide accelerators the vulcanizing process is correlated with the exchange capacity of the thiobenzothiazolyle radicals i.e. the more firmly the thio-benzothiazolyle groups are bound in

Card 3/4

27347
S/080/61/034/009/01?/016
D204/D305

The vulcanizing activity of ...

the sulphenamide compounds the slower the speed of vulcanization. There is still insufficient data to decide whether the reaction proceeds by a radical or bimolecular mechanism and this makes the exact role of the R' and R" radicals hard to determine. The [illegible]-change reactions studied here may be used for the synthesis of sulfenamide derivatives of 2-mercapto-benzothiazole with a labelled radioactive sulphur atom. There are 2 figures, 4 tables, and Soviet-bloc references.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i fiziko-khimicheskiy institut imeni L.Ya. Karpova (Scientific Research Institute of the Tire Industry and Physico-Chemical Institute im. L.Ya. Karpov)

SUBMITTED: June 24, 1960

Card 4/4

S/138/62/000/001/003/009
A051/A126

AUTHORS: Lakhman, L.S.; Fel'dshteyn, M.S.; Eytingon, I.I.

TITLE: The application of the BTMA(BTMA) accelerator for the vulcanization of cable rubber

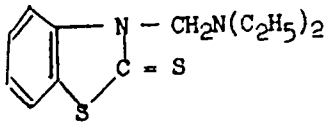
PERIODICAL: Kauchuk i rezina, no. 1, 1962, 7 - 11

TEXT: Two thiazole accelerators were compared: N-cyclo-hexyl-2-benzothiazol-sulfenamide (sulfenamide - (Ts)) and N-(diethylaminomethyl)benzothiazole-2-thione (BTMA), (the latter synthesized at the NIIShP - Scientific Research Institute of the Tire Industry). The action of the two accelerators different in structure was tested, together with thiuram, in the rubber vulcanization process for hose sheathing. The comparative characteristics of the two accelerators showed that sulfenamide Ts ensures a high scorching resistance of the rubber mix in which it is contained and helps to produce vulcanizates with high tensility. This accelerator, however, due to a delayed action in the initial stage of the vulcanizing process, does not meet the requirements called for by the vulcanizing systems of the cable rubbers. The BTMA accelerator renders the mix a high vulcanization rate. Introduction of phthalic anhydride, however,

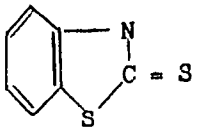
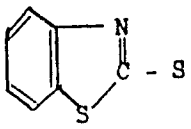
Card 1/3

The application of the BTMA accelerator for....

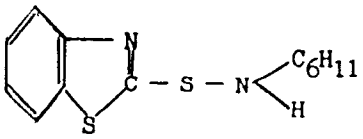
slows up this rate. BTMA offers the necessary resistance to scorching and ensures an increased resistance to thermal aging in the vulcanizates, if the other components of the vulcanizing group (sulfur, thiuram and phthalic anhydride) are added in a different ratio. The high vulcanizing activity in the first stage of vulcanization of the BTMA accelerators is due to the fact that the latter is an N-substituted derivative of captax (2-mercaptobenzothiazole):



(1)

Measurements of the exchange-ability with thiobenzothiazolyl radicals between the radioactive altax and this accelerator, and also sulfenamide Ts, showed that the radical  in compound (1) differs by having a greater mobility than the radical  in the compound

Card 2/3



(2)

Thanks to the strong vulcanizing action of BTMA, the sulfur content can be considerably reduced in the vulcanizing mixes which, in turn, strengthens the thermal aging resistance of the cable rubbers. There are 4 figures and 1 table.

ASSOCIATION: Moskovskiy kabel'nyy zavod "Elektroprovod" i Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Moscow Cable Plant "Elektroprovod" and Scientific Research Institute of the Tire Industry)

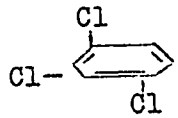
S/079/62/032/005/007/009
D204/D307

AUTHORS: Eytingon, I.I., and Strel'nikova, N.P.

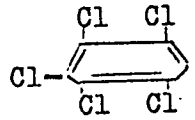
TITLE: Synthesis of polychlorobenzene-sulphene-dialkylamides

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 5, 1962, 1653-1655

TEXT: The authors prepared 5 new compounds:



$-S-NR_2$ (where R = Me, iso-Pr) and



$-S-NR_2$ (where R = Me, Et, iso-Pr), by the oxidative condensation of the corresponding tri- and pentachloro-thiophenols and secondary amines. The experimental method consisted of a slow mixing of the thiophenol, in the form of its Na salt, into an aq. solution of the amine, at 0-3°C, followed by addition of aq. NaOCl. The products were insoluble in water but dissolved in organic solvents.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

Card 1/2

S/079/62/032/005/007/009
D204/D307

Synthesis of polychlorobenzene- ...

SUBMITTED: May 30, 1961

Card 2/2

S/080/62/035/005/011/015
D244/D307

AUTHORS: Fel'dshteyn, M. S., Eytingon, I. I. and Pevzner, D. M.

TITLE: On the vulcanizing action of asymmetric thiuramsulphides containing aliphatic and heterocyclic groups

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 5, 1962, 1115-1119

TEXT: The authors investigated the vulcanizing activity of asymmetric thiuramsulphides containing piperidine, morpholine or piperazine groups together with dimethyl- or dimethylamino groups, in relation to the action of tetramethylthiuramsulphide. The vulcanization was conducted at 143°C. In addition to the accelerators (0.5 parts by weight) the mixture contained 100 parts of natural rubber, 3 parts of S, 5 parts of ZnO, 2 parts of stearic acid and 40 parts of channel carbon black. For butadiene-styrene rubber, 2 parts of S and 50 parts of carbon black were used. The compounds investigated were shown to be highly active accelerators for the natural and synthetic rubbers. In comparison with tetramethylthiuramsulphide, the compounds with heterocyclic groups imparted to

Card 1/2

the rubber mixtures a considerably greater stability to premature vulcanization. The asymmetric thiuramsulphides in which the heterocyclic groups contained two hetero-atoms gave an initial decelerated vulcanization unlike that produced by the aliphatic thiuramsulphides. There are 5 figures and 2 tables.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Tire Industry Research Institute)

SUBMITTED: May 8, 1961

EYTINGON, I. I.; STREL'NIKOVA, N. P.

New polychlorothiophenyl esters of N,N-dialkylthiocarbamic acids. Zhur. ob. khim. 32 no.12:3888-3890 D '62. (MIRA 16:1)

(Carbamic acid)

TARASOVA, Z.N.; EYTINGON, I.I.; SENATORSKAYA, L.G.; FEDOROVA, T.V.; SHISARENKO, A.M.; ANDRONOVA, G.I.; DOGADKIN, B.A.

Effect of thio derivatives of amines and phenols on the course of thermomechanical treatment and on fatigue of vulcanizates. Vysokom. soed. 5 no.6:892-899 Je '63. (MIRA 16:9)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Vulcanization) (Amines) (Phenols)

SHVARTS, A.G.; EYTINGON, I.I.; FROLIKOVA, V.T.; STREL'NIKOVA, N.P.

Some requirements for alkylphenol-formaldehyde resins used for the vulcanization of butyl rubber. Kauch. i rez. 22 no.10: 17-18 O '63. (MIRA 16:11)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

EYTINGON, I.I.; FEL'DSHTEYN, M.S.; LEVITIN, I.A.; KAMENSKAYA, S.A.

Investigating some phthalimide derivatives as preventers of premature vulcanization of rubber compounds. Kauch. i rez. 22 no.11:20-23 N '63. (MIRA 17:2)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i Moskovskiy shinnyy zavod.

BR

ACCESSION NR: AP4045700 S/0138/64/000/009/0025/0027

AUTHOR: Eytingon, I. I.; Borodushkina, Kh. N.; Kamenskaya, S. A.; Tikhacheva, Ye. P.

TITLE: Possible use of dimethylaminomethyl phthalimide as a secondary accelerator of vulcanization

SOURCE: Kauchuk i rezina, no. 9, 1964, 25-27

TOPIC TAGS: vulcanization, accelerator, dimethylaminomethyl phthalimide, diphenylguanidine, phthalic anhydride, N-nitrosodiphenyl amine, cushion rubber, tread rubber, tire manufacture, vulcanization accelerator / Altax, Captax, Santocure

ABSTRACT: Dimethylaminomethylphthalimide (AMP, b.p. 76-77C) was synthesized by the reaction of phthalimide with formalin and dimethylamine, after which it was combined with Captax, Altax and Santocure and tested in mixtures based on natural and butadiene-styrene rubbers. The tabulated data for unfilled mixtures of natural rubber containing AMP and Altax are compared with the data obtained for analogous mixtures with Altax and diphenylguanidine (DPG). It was found that AMP is a secondary accelerator of vulcanization of rubber mixtures, although with a lower activity than that of DPG. The necessary increase in AMP content results in a much smaller tendency to pre-vulcanization. Vulcanized rubbers containing di-

Card 1/2

ACCESSION NR: AP4045700

methylaminomethylphthalimide have characteristics (tensile strength, elongation, hardness, aging) equivalent to those of vulcanized rubbers containing diphenylguanidine except for the modulus of elasticity, which is somewhat higher. For some mixtures, AMP can completely replace diphenylguanidine and phthalic anhydride or N-nitrosodiphenyl amine. The experimental data for natural cushion rubbers (with 25 parts by weight of furnace gas black and 15 parts by wt. of channel black for 100 parts of rubber) and for tread rubbers (containing 50 parts by wt. of KhAF furnace black for 100 parts by wt. of rubber) based on butadiene-styrene with different amounts of components (Altax, Santocure and AMP) are tabulated and compared. The variation in properties depending on the amount of accelerators is discussed. "T. Gendler took part in the experimental work." Orig. art. has: 4 tables and 1 structural formula.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promy*shlennosti (Scientific Research Institute of the Tire Industry); Dnepropetrovskiy shinny*y zavod (Dnepropetrovsk Tire Plant)

SUBMITTED: 00 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 000 OTHER: 002

Card 2/2

ACC NR: AT8026775 (A) SOURCE CODE: UR/0081/67/000/018/3094/3094

AUTHOR: Tarasova, Z. N.; Senatorskaya, L. G.; Fedorova, T. Y.; Erlikhson, I. I.; Kaynin, S. M.; Dogadkin, B. A.

TITLE: Effect of the structure of vulcanizate [illegible] rubber compositions on the effectiveness of antifatigue agents

SOURCE: Ref. zh. Khimiya, Part II, Abs. 8S673

REF SOURCE: Sb. Sintez i issled. effektivn. stabilizatorov dlya polimern. materialov. Voronezh, 1964, 138-144

TOPIC TAGS: chemical stabilizer, thermomechanical property, synthetic rubber

ABSTRACT: p-Phenylenediamines, thioanilides, biphenols, thiophenols, phosphites and bisphosphites were studied as inhibitors (IN) of thermomechanical and thermal-oxidative degradation. The purity of the polymer has a strong influence on the stabilizing effect of IN. Additional introduction of IN into cured rubbers from raw rubbers treated with stabilizers causes a marked increase in stability only when they form a mutually reinforcing system with the stabilizers of the raw rubber. The composition and nature of the vulcanizing network substantially affect the stability of the cured rubbers and the manifestation of the action of IN. According to chemical relaxation data, the relative effectiveness of the action of IN increases with rising content of the accelerators in the mixtures. Increasing the stability of sulfur-free cured rub-

Card 1/2

L [illegible]
ACC NR: AR6026775

bers by using IH is difficult, and can be accomplished only by using certain categories of stabilizers. The introduction of carbon blacks into polyisoprene mixtures causes the thermomechanical and thermal-oxidative stability to decrease, and in the case of polybutadiene mixtures does not decrease the stability of the vulcanizates. M. Otopkova. [Translation of abstract]

SUB CODE: 11

Card 2/2 UCR

L 63797-65 EWT(m)/EPF(c)/EWP(j) RM

ACCESSION NR: AP5018793 UR/0138/65/000/007/0006/0010

678.063:541.68

AUTHOR: Tarasova, Z. N.; Senatorskaya, L. G.; Fedorova, T. V.; Eytingon, I. I.; Kirpichnikov, P. A.; Kavun, S. P.; Dogadkin, B. A.

TITLE: Effect of the structure of the vulcanizing network on the fatigue of rubber and study of methods of their stabilization

SOURCE: Kauchuk i rezina, no. 7, 1965, 5-10

TOPIC TAGS: stabilizer, antifatigue agent, antioxidant, vulcanizate fatigue, thermooxidation, zinc organic compound, synthetic rubber

ABSTRACT: The article reports on a study of the effect of zinc diisopropyl dithiophosphate, zinc diisopropyl dithiocarbamate and their combinations with derivatives of phenols and paraphenylenediamines on the stabilization of vulcanizates prepared from NK, SKI-3, SKD, and SKS-30 ARKM rubbers in the course of thermal and thermooxidative treatment in static tension and under repeated deformation. It was found that compounds containing branched alkyl groups in the molecule, particularly the diisopropyl group, have the greatest stabilizing effect against the thermomechanical and thermooxidative processes associated with the fatigue of vulcanizates. Zinc diisopropyl dithiophosphate is a weak vulcani-

Card 1/2

L 63797-65

ACCESSION NR: AP5018793

3

zation accelerator and produces vulcanizates with a lesser sulfide character of the cross links. It does not affect the induction period of the oxidation of rubber and vulcanizates by molecular oxygen, but speeds up the decomposition of cumene hydroperoxide in rubber solutions as a result of the oxidation of sulfur to the corresponding sulfoxides. In contrast to the antifatigue agents and antioxidants commonly used, which do not stabilize the processes of thermal degradation, zinc diisopropyl dithiophosphate has an inhibiting influence on the thermomechanical breakdown of the vulcanizing network. The use of oxidation inhibitors in conjunction with substances stabilizing the thermal cleavage of bonds is an effective means of combating the fatigue of rubbers containing polysulfide bonds at high temperatures. Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, GC

NO REF SOV: 007 OTHER: 004

Card 2/2

L 17564-65 EWT(m)/EWP(j)/T Pc-4 RM
ACCESSION NR: AP4049783 S/0138/64/000/011/0022/0024

AUTHOR: Ronkin, G. M.; Levitin, I. A.; Shvarts, A. G.; Eytingon, I. I.

TITLE: Effect of alkylphenolformaldehyde resins on the sulfur vulcanization of butyl rubber

SOURCE: Kauchuk i rezina, no. 11, 1964, 22-24

TOPIC TAGS: butyl rubber, synthetic rubber, sulfur vulcanization, methylol resin, phenol formaldehyde resin

ABSTRACT: It was assumed that the addition of small amounts of methylol-containing resins to mixes of butyl rubber being vulcanized with sulfur would reduce the speed of vulcanization of these mixes and reduce the danger of scorching. Use was made of different commercial resins based on p-tert-butylphenol and p-octylphenol, as well as a technical, low-molecular product of the condensation of phenol with an excess of methylol groups. The addition of small amounts of products containing 12-20% methylol groups gives mixes with a smaller tendency toward scorching and higher physico-mechanical indices of the sulfur vulcanizates from butyl rubber than the addition of large amounts of resins with a small content of methylol groups. The addition of small amounts of phenols with a high

Card 1/2

L 17564-65
ACCESSION NR: AP4049783

2

content of methylol groups to ordinary rubber mixes makes it possible to reduce preliminary structuring of these mixes without a substantial impairment of the properties of the vulcanizates. Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: Moskovskiy shinny*y zavod (Moscow Tire Factory); Nauchnoissledovatel'skiy institut shinnoy promy*shlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: 00 ENCL: 00 SUB CODE: MT

NO REF SOV: 003 OTHER: 000

Card 2/2

L 3379-66 EWT(m)/EPF(c)/EWP(j) RM

ACCESSION NR: AP5022090 UR/0138/65/000/008/0009/0012 50 47 8

678.044:536.45.096

AUTHOR: Eytingon, I. I.; Krasukhina, M. M.; Kavun, S. M.; Strel'nikova, N. P.; Butyugin, V. K.

TITLE: Thermal conversion of an N-cyclohexylbenzothiazole-2-sulfenamide vulcanization accelerator

SOURCE: Kauchuk i rezina, no. 8, 1965, 9-12

TOPIC TAGS: rubber chemical, organic substituted amide, organic sulfur compound, EPR spectrum, thermochemistry, free radical, vulcanization, reaction mechanism, heat resistance

ABSTRACT: The effect of rubber mixing and vulcanization temperatures on the conversion of sulfenamide Ts [Abstractor's note: Compound corresponds to "Santocure."] and the effect of additives on the thermal stability of this vulcanization accelerator were studied. Heating of the sulfenamide samples at 105-110C for 2 and 6 hours did not produce significant change in the melting of the material except to lower its melting temperature slightly. Thermal decomposition of the sulfenamide at 140 -145 C is preceded by an induction period whose length depends

Card 1/2

L 3379-66
ACCESSION NR: AP5022090

3

on the impurities present. Decomposition is accompanied by spontaneous temperature increase and evolution of hydrogen sulfide and amine. 2-Mercaptobenzothiazole, its cyclohexylamine salt, and 2,2'-dibenzothiazyldisulfide were separated and identified among the resinous decomposition products. The effects of adding these three compounds or sulfur to mixes containing the sulfenamide were studied. Sulfur had the greatest effect on the thermal stability of the accelerator at 140-145 C, and the addition of 1% sulfur on weight of the sulfenamide reduced the induction period from 150 to 10 minutes. Examination of EPR spectra established that the thermal decomposition of this sulfenamide is a radical chain process. The presence of benzothiazolesulfide radicals was indicated. Orig. art. has: 3 figures and 4 equations

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute for the Tire Industry) 44

SUBMITTED: 00 ENCL: 00 SUB CODE:

NR REF SOV: 001 OTHER: 002

Card 2/2 nd

EYTINGON, I.I.; STREL'NIKOVA, N.P.

Polychlorobenzenesulfenamides based on morpholine, piperidine, and cyclohexylamine. Zhur. ob.khim. 34 no. 5:1608-1609 My '64. (MIRA 17:7)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

L 11585-66 EWT(m)/EWP(j) RM

ACC NR: AP5028892 SOURCE CODE: UR/0316/65/000/004/0058/0064

44,55 44,55 44,55 35

AUTHOR: Shvarts, A. G.; Sadykhova, U. K.; Eytingon, I. I.

B

44,55 15,44,55

ORG: AzINEFTEKhIM im. M. Azizbekova

TITLE: Study of vulcanization activity in alkylphenolformaldehyde resins containing methoxy- and bromomethyl terminal groups

SOURCE: Azerbaydzhanskiy khimicheskiy zhurnal, no. 4, 1965, 58-64

TOPIC TAGS: vulcanization, resin, polyformaldehyde plastic, synthetic material

ABSTRACT: The effect of introducing terminal methoxy- and bromomethyl groups to the p-octylphenolformaldehyde resins (BOFFA and OFFA commercial resins) on the mechanical properties of these resins and the rate of vulcanization was studied. The rate of vulcanization was studied with and without $SnCl_2 \cdot 2H_2O$ activator. A VR-2 plastometer measured resin viscosity at 110°, 120°, 130°, and 140°C. The degree of resin cross-linking was measured by swelling technique at 140°, 150°, 160°, 170° and 180°C. The vulcanization rate in the bromine-containing resin mixture was 1.8 times greater than that in the methoxy-groups containing resin mixture. The vulcanization accelerating action of the bromomethyl groups was particularly pronounced in the absence of vulcanization activator. Presence of bromomethyl groups also caused an increase in cross-linking. Introduction of the bromomethyl groups was reflected in a general improve-

Card 1/2

L 11585-66

ACC NR: AP5028892

ment in the physicomechanical properties of the commercial p-octylphenolformaldehyde resins. Orig. art. has: 5 figures, 5 tables.

SUB CODE: 11/ SUBM DATE: 14Apr64/ ORIG REF: 006/ OTH REF: 000

HW

Card 2/2

L 35545-65 EWT(m)/EWP(j) Pc-4 RM

ACCESSION NR: AP5008190 S/0286/65/000/005/0069/0069

AUTHORS: Bytingon, I. I.; Fel'dshteyn, M. S.; Levitin, I. A.; Kamenskaya, S. A. 21

TITLE: A method for stabilizing raw rubber mixtures. Class 39, No. 168868

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 5, 1965, 69

TOPIC TAGS: rubber, rubber mixture, rubber research, stabilization, tetrahydrophthalein

ABSTRACT: This Author Certificate presents a method for stabilizing raw rubber mixtures, involving the application of antiscorching. To increase the stability and broaden the assortment of antiscorching materials, 1, 2, 3, 6-tetrahydrophthalic anhydride is applied as an antiscorch material.

ASSOCIATION: none

SUBMITTED: 20Dec61 ENCL: 00 SUB CODE: IE, OC

NO REF SOV: 000 OTHER: 000

Card 1/1

L 63797-65 EWT(m)/EPF(c)/EWP(j) RM
ACCESSION NR: AP5018793 UR/0138/65/000/007/0005/0010
678.063:541.68

AUTHOR: Tarasova, Z. N.; Senatorskaya, L. G.; Fedorova, T. V.; Eytingon, I. I.; Kirpichnikov, P. A.; Kavun, S. P.; Dogadkin, B. A.

TITLE: Effect of the structure of the vulcanizing network on the fatigue of rubber and study of methods of their stabilization

SOURCE: Kauchuk i rezina, no. 7, 1965, 5-10

TOPIC TAGS: stabilizer, antifatigue agent, antioxidant, vulcanizate fatigue, thermooxidation, zinc organic compound, synthetic rubber

ABSTRACT: The article reports on a study of the effect of zinc diisopropyl dithiophosphate, zinc diisopropyl dithiocarbamate and their combinations with derivatives of phenols and paraphenylenediamines on the stabilization of vulcanizates prepared from NK, SKI-3, SKD, and SKS-30 ARKM rubbers in the course of thermal and thermooxidative treatment in static tension and under repeated deformation. It was found that compounds containing branched alkyl groups in the molecule, particularly the diisopropyl group, have the greatest stabilizing effect against the thermomechanical and thermooxidative processes associated with the fatigue of vulcanizates. Zinc diisopropyl dithiophosphate is a weak vulcani-

Card 1/2

L 63797-65

ACCESSION NR: AP5018793

3

zation accelerator and produces vulcanizates with a lesser sulfide character of the cross links. It does not affect the induction period of the oxidation of rubber and vulcanizates by molecular oxygen, but speeds up the decomposition of cumene hydroperoxide in rubber solutions as a result of the oxidation of sulfur to the corresponding sulfoxides. In contrast to the antifatigue agents and antioxidants commonly used, which do not stabilize the processes of thermal degradation, zinc diisopropyl dithiophosphate has an inhibiting influence on the thermomechanical breakdown of the vulcanizing network. The use of oxidation inhibitors in conjunction with substances stabilizing the thermal cleavage of bonds is an effective means of combating the fatigue of rubbers containing polysulfide bonds at high temperatures. Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, GC

NO REF SOV: 007 OTHER: 004

Card 2/2

L 56670-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM
ACCESSION NR: AP5017845 UR/0286/65/000/011/0079/0079
678.028.044.3

AUTHOR: Eytingon, I. I.; Kamenskaya, S. A.; Borodushkina, Kh. N.; Gendler, T.R.; Levitin, I. A.; Boguslavskiy, D. B.

TITLE: A method for vulcanizing unsaturated rubber. Class 39, No. 171571

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 11, 1965, 79

TOPIC TAGS: rubber vulcanization, vulcanization acceleration

ABSTRACT: This Author's Certificate introduces a method for vulcanizing unsaturated rubber using accelerators and secondary accelerators--aminomethyl derivatives of dicarboxylic acid imides. A wider selection of secondary accelerators is provided by using piperidino- and morpholinomethyl derivatives of dicarboxylic acid imides.

ASSOCIATION: none

SUBMITTED: 09Dec63 ENCL: 00 SUB CODE: MT , GC

NO REF SOV: 000 OTHER: 000

Card 1/1

SHVARTS, A.G.; SADYKHOVA, U.K.; EYTINGON, I.I.

Vulcanization activity of alkylphenol-formaldehyde resins containing terminal methylol and bromomethyl groups. Azerb. khim.zhur. no.4:58-64 '65. (MIRA 18:12)

1. Azerbaydzhanskiy institut nefti i khimii imeni Azizbekova. Submitted April 14, 1964.

EYTINGON, I.I.; KRASUKHINA, M.M.; KAVUN, S.M.; STREL'NIKOVA, N.P.; BUTYUGIN, V.K.

Transformation of the vulcanization accelerator N-cyclohexyl-benzothiazole-2-sulfenamide during thermal treatment. Kauch. i rez. 24 no.8:9-12 '65. (MIRA 18:10)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

L 04977-67 EWT(m)/EWP(j) LJP(c) RM
ACC NR: AP6030598 (A,N) SOURCE CODE: UR/0413/66/000/016/0091/0091

INVENTOR: Eytingon, I. I.; Tarasova, Z. N.; Vinogradova, T. N.; Senatorskaya, L. G.; Zhukova, I. I.

ORG: none

TITLE: Stabilization of rubbers. Class 39, No. 185050

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966, 91

TOPIC TAGS: rubber stabilization, paraphenylenediamine derivative, rubber, chemical stabilization

ABSTRACT: An Author Certificate has been issued for a method of stabilizing rubbers by the addition of bis-(1-anilinomethyl-3-aminomethyl-2-naphtol)-N,N'-p-phenylenediamine [sic] to rubber mixtures. [BO]

SUB CODE: 11/ SUBM DATE: 17May65/

Card 1/1 UDC: 678.4.048.25

L 12850-63 EPR/EWP(j)/EPF(c)/EWT(m)/BDS AFFTC/ASD Ps-4/Pr-4/Pc-4 84
RM/WW/JT
ACCESSION NR: AP3001163 S/0190/63/005/006/0892/0899 76

AUTHOR: Tarasova, Z. N.; Eytington, I. I.; Senatorskaya, L. G.; Fedorova, T. V.; Snisarenko, A. M.; Andronova, G. I.; Dogadkin, B. A.

TITLE: Effect of thio-derivatives of amines and phenols in the process of thermomechanical treatment and fatigue of vulcanizates

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 5, no. 6, 1963, 892-899

TOPIC TAGS: vulcanizates, fatigue of vulcanizates, thermomechanical treatment, thio-derivatives of amines, thio-derivatives of phenols, rate of oxygen uptake, hydroperoxides, synergistic effect

ABSTRACT: Earlier publications by the authors demonstrated that thermomechanical stresses cause a breakdown and regrouping of the vulcanization network in vulcanizates, the ultimate sheer modulus depending on the course of the regrouping processes. Since similar phenomena are taking place also in thermo-oxidative processes, where a key role belongs to the free radicals, it was logical to assume that the properties of vulcanizates would be influenced by substances capable of controlling the oxidations and the free radicals as well. To this end, thio-derivatives of amines and phenols were chosen, and their effect on the decomposition

Card 1/2

L 12850-63
ACCESSION NR: AP3001163

1

of cumenehydroperoxide and on the kinetics of oxygen uptake by rubber studied, using the electron para-magnetic resonance technique. It was found that in the presence of 0.02 Mol of thiodiphenylamine per 1 Mol of peroxide it takes 90 minutes for its complete decomposition, as against 30 minutes with diphenylamine and 20 minutes without an inhibitor. The addition of 0.5 Millimol of the same amines to 100 gm rubber at 130C showed within one hour a barely noticeable oxygen uptake in the presence of thiodiphenylamine, as against 400 ml/gm for diphenylamine, while the control reached the latter figure within 30 minutes. The thio-derivatives of amines and phenols also showed a much more pronounced effect on the rate of chemical relaxation and a higher fatigue resistance of the vulcanizates as compared with the corresponding amines. An additional advantage of the thio-derivatives is their synergistic effect. It is concluded that the thio-derivatives of amines are more effective, as compared to the amines, in the preservation of the original vulcanization network in the processes of thermo-oxidative and thermomechanical influences. It is mentioned in footnotes that measurements by the electron paramagnetic resonance technique were obtained by Kashlinskaya, A. I. on an installation OKBA of the Goskhimkomitet, and that the spectrum was taken by Kavun, S. M. on a RE-1301 radiospectrometer of the Scientific Research Institute of the Tire Industry. Orig. art. has: 1 formula, 7 charts, and 3 tables.

Scientific Research Inst. of the Tire Industry

Card 2/2

EYTMANAVICHENE, N. [Eitmanaviciene, N.]

In the Commission of the history of Natural Science and Technology at the Presidium of the Academy of Sciences. Trudy AN Lit. SSR. Ser. B. no. 4:232 '65 (MIRA 19:2)

EYTMINAVICHYUTE, I. S.: Master Biol Sci (diss) -- "Oribatidae of the Lithuanian SSR". Vil'nyus, 1958. 22 pp (Min Higher Educ USSR, Vil'nyus State U im V. Kapsukas), 150 copies (KL, No 6, 1959, 131)

EYTMINAUICHUTE, I.

"The Oribatidae Mites of the Lithuanian SSR."

Tenth Conference on Parasitological Problems and Diseases with Natural Reservoirs, 22-29 October 1959, Vol. II, Publishing House of Academy of Sciences, USSR, Moscow-Leningrad, 1959.

Institute of Zoology and Parasitology, Lithuanian Academy of Sciences (Vilnius)

MANSUROVA, I.D.; EYTSEN, E.F.

Histochemical study of the alkaline phosphatase activity in the liver tissue of patients with hepatitis and cirrhosis. Trudy Inst. khimv. med. AN Tadzh. SSR no.1:57-[illegible] '62. (MIRA 17:5)

EYTSEN, E.F.

Effectiveness of vitamin B_{12} therapy in patients with acute and chronic lesions of the liver. Report No.1:Results of treatment under control of intravital histological studies of the liver in Botkin's disease. Trudy Inst. kraev. med. AN Tadzh. SSR no.1:217-224 '62.

Report No. 2. Results of treatment under control of intravital histological studies of the liver in chronic hepatitis and cirrhosis of the liver. Ibid.:225-230 '62. (MIRA 17:5)

EYTSEN, E.F.

Treatment of Botkin's epidemic hepatitis with various doses of vitamin B_{12}. Akt. vop. pat. pech. no.2:210-218 '63.
(MIRA 18:8)

BASKUTIS, P., prof., red.; YANITSKIS, I.[Janickis,I.], doktor khim. nauk, prof., red.; VIDMANTAS, Yu.[Vidmantas, J.], prof., otv. red.; STANAYTIS, I.[Stanaitis, I.], starshiy prepodavatel'., red.; BRAYNIN, S., kand. istor. nauk, dots., red.; INDRYUNAS, I., [Indriunas, I.], doktor tekhn. nauk, prof., red.; LASINSKAS, M., kand. tekhn. nauk, red.; NOVODVORSKIS, A., kand. tekhn. nauk, dots., red.; PESIS, R.[Pesys, R.], kand. tekhn. nauk, dots., red.; SADAUSKAS, T., dots., red.; SHESHEL'GIS, K.[Seselgis, K.], kand. arkh. dots., red.; VASAUSKAS, S., kand. tekhn. nauk, dots., red.; ZDANIS, Yu. [Zdanis, J.], kand. tekhn. nauk, red.; GRIGALYUNAS, B. [Grigaliunas,B], red.; EYTUTIS, V.[Eitutis, V.], red.; VIDMANTAS, Yu.[Vidmantas,J.], red.; NAUYOKAS, I. [Naujokas,I.], tekhn. red.

[Materials of the 5th Scientific Technical Conference of Students of Institutions of Higher Learning of the White Russian S.S.R., Latvian S.S.R., Lithuanian S.S.R. and Estonian S.S.R.] Trudy Nauchno-tekhnicheskoi konferentsii studentov vysshikh uchebnykh zavedenii Belorusskoi SSR, Latviiskoi SSR, Litovskoi SSR i Estonskoi SSR, 5th. Kaunas, Izd. Kaunasskogo politekhn. in-ta, 1961. 205 p. (MIRA 14:12)

1. Nauchno-tekhnicheskaya konferentsiya studentov vysshikh uchebnykh zavedeniy Belorusskoy SSR, Latviyskoy SSR, Litovskoy SSR i Estonskoy SSR, 5th.

(Science—Congresses) (Technology—Congresses)

PUSHKIN, N.I.; kand. tekhn. nauk; EYTVID, L.V., kand. tekhn. nauk

"Testing marine steam boilers" by L. A. Babadzhanian, A. K. Gol'denfon. Reviewed by N. I. Pushkin, L. V. Eitvid. Sudostroenie 25 no.6:52-53 Je '59. (MIRA 12:9)
(Boilers, Marine--Testing)
(Babadzhanian, L.A.)
(Gol'denfon, A.K.)

EYTVID, L.V.

Some data concerning experimental determination of the aerodynamic resistance of stacks of barrels. Trudy LKI no.31:117-121 '60. (MIRA 15:2)

1. Kafedra sudovykh parovykh kotlov Leningradskogo korablestroitel'nogo instituta.
(Aerodynamic measurements) (Ships—Heating and ventilation)

GOL'DENFON, Aleksandr Kel'manovich; BABADZHANYAN, Levon Arakelovich; MASLOV, V.V., kand. tekhn. nauk, retsenzent; GERLOVIN, L.I., inzh., retsenzent; EYTVID, L.V., nauchnyy red.; OZEROVA, Z.V., red.; TSAL, R.K., tekhn. red.

[Performance and operation of marine boilers]Rabochie protsessy i ekspluatatsiia sudovykh kotlov. Leningrad, Sudprongiz, 1962. 423 p. (MIRA 15:11)

(Boilers, Marine)

PUSHKIN, N.I.; TURIAKOV, A.S.; EYTVID, L.V.

Heat emission and the hydraulic resistance of steam air preheaters in marine boilers. Trudy LKI no.36:75-84 '62. (MIRA 16:12)

1. Kafedra sudovykh parovykh kotlov Leningradskogo korablestroitel'nogo instituta.

EYUBOV, A., agronom

Glorious results of work on an Azerbaijan collective farm.
Zashch. rast. ot vred. i bol. 2 no.6:21-23 N-D '57. (MIRA 16:1)

1. Kolkhoz "Put' k kommunizmu", Kubinskiy rayon, AzerSSR.
(Azerbaijan--Fruit--Diseases and pests)

EYUBOV, A.D.

Snowstorms in the Azerbaijan S.S.R. Dokl.AN Azerb.SSSR 17 no.4:315-318 '61. (MIRA 14:6)
(Azerbaijan--Snow)

EYUBOV, I.Z.

EYUBOV, I.Z.; ALI-ZADE, M.A.

Determination of sugar in the blood dried on filter paper. Lab.delo 7 no.9:11-12 S '61. (MIRA 14:10)

1. Nauchno-issledovatel'skiy veterinarnyy institut Azerbaydzhanskoy akademii sel'skokhozyaystvennykh nauk.
(BLOOD SUGAR) (PAPER CHROMATOGRAPHY)

[illegible], M.M., prof., [illegible], kand. veter. nauk [illegible]
zasluzhennyy veterinarnyy vrach Azerb SSR

Alimentary anemia in lambs. Veterinariia 41 no.7 [illegible]
Jl '64. [illegible]

1. Azerbaydzhanskiy nauchno-issledovatel'skiy veterinarnyy
institut.

EYUBOV, M.A.

Use of pneumoperitoneum in the postoperative period of inferior lobectomy. Azerb.med.zhur. 42 no.1:64-68 Ja '65.
(MIRA 18:5)

EYUBOV, R.E.

Effect of presowing irradiation of seeds with gamma rays of Co^{60} and neutrons on the technological properties of raw cotton and the fiber yield. Izv. AN AZerb. SSR. Ser. biol. i med. nauk no.2:67-71 '62. (MIRA 17:6)

GUSEYNOV, D.M.; MYUBOV, R.Ye.

Effect of organic substances of petroleum origin on the absorption of P^{32} and Sr^{90} by plants. Izv. AN Azerb. SSR no.1:77-87 '58.
(Azerbaijan--Petroleum industry--By-products) (MIRA 11:6)
(Minerals in plants)
(Fertilizers and manures)

GUSEYNOV, D.M.; EYUBOV, R.E.

Effect of ionizing radiation on cotton maturation and yield.
Report No.2. Dokl.AN Azerb.SSR 15 no.8:713-717 '58.
(MIRA 13:1)

1. Institut agrokhimii i pochvovedeniya AN AzerSSR.
(Cotton) (Radioactivity--Physiological effect)